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How long is too long? Long-term effects of maternity-related job interruptions on mothers' income in 10 European countries

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### Abstract

This article inquires whether work interruptions due to childbearing and childrearing have long-term effects on mothers' absolute and relative income in later life in ten European countries. Previous studies have found significant differences in earned income among prime-age women and men, and mothers and fathers, with mothers earning significantly less than men and childless women, both in absolute and relative terms. Many factors account for such differences, including mothers' reduced working hours and productivity, the type of job, job interruptions, self-selection and statistical discrimination. However, while research has investigated the short- and medium-term consequences of having children on mothers absolute and relative earnings, less is known about the long-term effects of childbearing and childrearing on mothers' income in later life. In this article, we investigate whether the length of maternity-related work interruptions is associated with income inequalities at a later age. The analysis, based on four waves of SHARE data (N 7,746), indicates that while short work interruptions are not negatively associated with mothers' absolute and relative earned income in later life, long work interruptions and a failure to return to work have a large impact on women's long-term economic wellbeing, especially in countries where decommodification through family and pension policies is limited.

**Keywords:** motherhood penalty, gender gap, earned income, pensions, SHARE.

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## **Introduction**

This article addresses long-term absolute and relative income inequality among mothers aged 45 and above in ten European countries. Much previous research has focused on absolute differences in income and earnings between childless women and men, mothers and fathers (Sigle-Rushton and Waldfogel 2007), and between women and their partners (Dotti Sani 2015; Klesment and Van Bavel 2017; Stier and Mandel 2009). Beyond predictable variations tied to socio-economic background and type of occupation (England et al. 2016), empirical evidence on the topic is univocal: mothers have lower earnings than childless women and men. Multiple explanations of the so-called motherhood penalty have been suggested (Budig and England 2001): mothers are likely to have less remunerative albeit family-friendly jobs, or to work part-time; they may be less productive at work; they may miss important career opportunities or crucial training while on leave; they might suffer statistical discrimination; or they could be a self-selected group. In contrast, either because they increase their productivity in view of family enlargement or because of positive selection into fatherhood, fathers tend to earn more than childless men (Killewald 2013).

The combination of motherhood penalties and fatherhood premiums leads to the formation of a ‘family gap’ in income. This has immediate consequences in terms of relative power within the couple, and can have negative medium- and long-term consequences in the case of partnership dissolution through death or divorce (Fasang et al. 2013; Peeters and De Tavernier 2015). Moreover, a key finding in previous literature is that women have lower pensions than men in many western countries (Folbre et al. 2007). This result is attributed to the very different lifecycles of women and men, with women being more responsible for unpaid domestic work and therefore less likely than men to be employed, to be employed full-time, or to earn a high income. Moreover, women who do work are much more exposed to job interruptions than men (Jefferson 2009). However, while much research has investigated the short- and medium-term consequences of job interruptions, less is known about the long-term consequences of interruptions due to childbearing and childrearing on elderly mothers’ absolute and relative earned income. Indeed, previous research on gender differences in income in later life is mostly based on single-country studies (Baum 2002; Ejrnæs and Kunze 2013; Phipps et al. 2001). Cross-national studies investigating the long-lasting effects of childbirth and child-related work interruptions on women’s earnings seldom focus on mothers in their later years (e.g. aged 60 and above), and international comparisons are mostly confined to a few countries (Fasang et al. 2013; Ginn 2003; Phipps et al. 2001; Sigle-

Rushton and Waldfogel 2007). In a nutshell, the literature has repeatedly outlined that men out-earn their wives and partners and has revealed the existence of a family gap in earnings, especially in the presence of children, but the extent to which motherhood penalties and fatherhood premiums engender long-term differences in earned income has not been fully investigated.

Following Peeters and De Tavernier (2015: 1172), we argue that to understand “why the financial situation of many elderly women remains so precarious, it is essential to investigate how family histories, career histories and social policy interact.” Therefore, this article goes beyond previous research by taking a comparative approach to studying income inequalities among mothers in later life (average age 65). Specifically, considering that work interruptions for childbearing and childrearing are known to have negative consequences on women’s labour force participation and therefore on their earnings, savings and pensions, we test the extent to which absence from work due to childbearing and childrearing impacts mothers’ absolute and relative earned income at an older age. Moreover, we test whether family policies and pension systems (Esping-Andersen 1990; Korpi et al. 2013) mitigate the relationship between work interruptions and income. The analysis is based on data from the Survey of Health, Ageing and Retirement in Europe (SHARE), rounds two (2006-7), four (2011-12) and five (2013), combined with the retrospective wave of the survey (round three, 2008-2009), and concerns ten European countries: Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain and Sweden. Our results indicate that cross-national differences in income in later life among mothers are consistent with those found in previous studies, with mothers being better off in northern European countries than in southern and continental ones. Moreover, our findings indicate that short maternity interruptions do not imply long-term penalties, whereas longer interruptions and a failure to return to work completely do indeed have negative consequences on absolute and relative income. However, in line with our expectations, the negative effects of work interruptions appear to be less pronounced in northern European countries.

### **Work interruptions and mothers’ long-term income**

Much research has shown that the gender gap in income and earnings persists in later life. Indeed, research has shown that women have lower pensions than men in many western countries (Burkevica et al. 2015; Fasang et al. 2013; Peeters and De Tavernier 2015; Sefton et al. 2011) and that elderly women are especially vulnerable

to poverty risks (Gornick et al. 2009; Peeters and De Tavernier 2015). According to Jefferson (2009: 114), “women’s traditional patterns of unpaid care work tend to be linked with fewer average years of paid work, relatively high representation in part-time work, and gender gaps in earnings and lifetime incomes. Thus, when pension-scheme coverage is based on participation in paid work, women and men are likely to have different outcomes.” Especially for older generations of women, employment throughout the life course was not the norm: women were expected to retreat from the labour market when they had children and were not necessarily bound to return (Peeters and De Tavernier 2015). In turn, the pension systems in many countries were designed to cover the economic needs of couples formed by male breadwinners and female homemakers (Esping-Andersen, 1990).

In the light of the gender differences in unpaid domestic work and the bearing, rearing and caring of children, work interruptions due to maternal responsibilities are obvious candidates for explaining long-term gender differences in income among the elderly (Mincer and Ofek 1982; Sigle-Rushton and Waldfogel 2007). However, most research on the topic has focused on the short-term effects of job interruptions on mothers’ labour market behaviour (Boeckmann et al. 2015; Lalive and Zweimüller 2009; Uunk et al. 2005) and subsequent earnings (Budig and Hodges 2010, 2010; Sefton et al. 2011), while few cross-national studies have tested the long-lasting effects of childbirth and child-related work interruptions on women’s earnings.

Among the studies that have focused on the long-term consequences of family events on women’s income in a broader comparative perspective, Sigle-Rushton and Waldfogel (2007) use data from the Luxembourg Income Study to investigate the differences in long-term earnings between childless women, mothers and men in eight industrialized countries. Their results indicate that mothers have lower earnings than childless women and men, and the effects of childbearing and childrearing are not just immediate but also long-lasting. However, their analysis based on women and men up to the age of 45 does not shed light on income inequalities in later life. In a single-country study on Britain by Ginn (2003), General Household Survey data are used to study the private pension coverage of women with different marital and parenthood statuses in three stages of the life course. The analysis indicates that both in the midlife and younger groups mothers have lower chances of contributing to individual pension plans compared to childless women. Using data for the US from the National Longitudinal Survey of Young Women, Kahn et al. (2014) show that motherhood has negative consequences on women’s labour force participation, occupational status and wages, but that the negative

effects decrease with age. However, women older than fifty are excluded from the study, leaving unanswered questions about the very long-term consequences of motherhood on income. Similarly, Phipps et al. (2001) for Canada show that work interruptions negatively affect mothers' wages but the effects are larger for those who change job after the interruption. Again, however, the results are confined to women aged 54 or younger.

From a theoretical perspective, long work interruptions are bound to have negative effects on mothers' long-term pensions and earnings. On the one hand, a fragmented work history inevitably reduces contributions to both public and private pension plans, therefore leading to lower pension entitlements (Ginn 2003). On the other hand, longer work interruptions reduce labour market attachment (Lalive and Zweimüller 2009), limit mothers' wages (Baum 2002; Ejrnæs and Kunze 2013; Phipps et al. 2001) and reduce the chances of being promoted and progressing in their careers, all of which decrease income in later life. Moving beyond mothers' absolute income to considering family gaps, research shows that men tend to increase their work efforts and therefore their income when they become fathers i) to fulfil the 'good provider' role and ii) to make up for the mother's income reduction. Because of this, they are not only ameliorating their current income situation; they are also investing in their careers and putting money into pension plans, thus setting the ground for their long-term economic well-being. Therefore, based on this reasoning and on previous research, our first hypothesis (H1) is that the longer a mother abstains from work due to maternal responsibilities, the lower her (a) absolute and (b) relative income will be in later life. However, considering important structural and cultural differences in the countries under consideration, we also anticipate cross-national differences in the effects of job interruptions in mothers' later life, which we discuss in the following section.

### **The moderating role of the welfare state: family policies and pension systems**

Previous studies have underlined the fundamental role of national institutional and cultural features in shaping women's labour market behaviour around childbirth. Family policies, such as the duration of maternity and parental leave and the relative level of remuneration, childcare availability, legislation regarding job protection and cultural norms regarding childrearing practices, all contribute to women's decisions regarding work interruptions.

The differences in maternity and parental leave regulations characterizing the countries selected for analysis in the years under study are pivotal for our study. In most of the countries, maternity leave was provided for

as early as the 1960s, and since then the amount of time off work around childbirth and maternity pay have increased considerably in all countries (Gauthier 2011)<sup>i</sup>. However, some countries offered more generous packages from the beginning. Among these, Austria granted 12 weeks of maternity leave at 100% of the previous pay in 1960, and the number of weeks grew to 16 in 1974. Germany has also traditionally offered new mothers generous protection, with 100% pay for 12 weeks until the 1970s and later for 14 weeks. Similarly, new Dutch mothers could rely on 12 weeks at 100% from 1960, which were increased to 16 in the 1990s. In 1960, France granted 14 weeks at 50% pay, which became 90% in 1970. The number of weeks and the pay were increased over the years, and since 2010 new French new mothers have been able to stay at home for 16 weeks at 100% of their previous pay. Maternity pay in Denmark was set at 19% for 14 weeks in 1960 but it rapidly grew to 90% for 18 weeks in the 1990s and then declined in the following years as new parental and childcare leave schemes were introduced. The Swedish case is a peculiar one. While new mothers were relatively well protected in earlier days, with 26 weeks of leave remunerated at nearly 70% in 1969, maternity leave was abolished in the 1970s and was replaced with a more comprehensive package of parental and childcare leaves that were not reserved exclusively for mothers. The parental leave scheme was especially generous and, despite several changes over the years, it allowed new mothers a prolonged period at home with relatively high pay.

A second group of countries provide a somewhat less comprehensive coverage of maternity interruptions. In Belgium, a maternity leave scheme was introduced in 1958 with 12 weeks covered at 60%. Over the years, it was gradually increased to reach 16 weeks covered at about 77% in the late 2000s. Similarly, maternity leave in Spain was for 12 weeks at 60% in 1960. It was increased in the following years to 16 weeks at 100%. Greece has one of the least generous schemes, with a maternity pay of 50%, which remained stable from 1960 to 2010. Only the number of weeks increased, from 12 to 17. Italy also fails to fully compensate its new mothers, with a maternity pay at 80% for a relatively long period of 21 weeks. Countries that extensively protect new mothers around childbirth with maternity leave also provide rather generous forms of parental leave. These countries include Austria, Denmark, Germany, France and Sweden. In contrast, the parental leave schemes of Italy, Spain, Belgium, the Netherlands and Greece are much scantier.

The literature on the effects of work interruptions for childbearing and childrearing generally finds that mothers are more likely to return to work when the leave is short and well-remunerated, whereas a long unpaid

leave reduces mothers' chances of returning to the workforce<sup>ii</sup> (Lalive and Zweimüller 2009; Uunk et al. 2005). Therefore, we would expect the long-term negative effects of work interruptions to be more modest in countries where maternity pay is high and for a relatively short period of time. Thus, our second hypothesis (H2) is that in countries where maternity and parental allowances are generous, the long-term effects of work interruptions should be smaller, also in terms of income inequalities within couples. This should be the case for Denmark and Sweden and, to a smaller extent, Germany, France and Austria.

A second factor to consider regards the characteristics of the pension system. Different models of pension system have been identified in the literature on the basis of the institutional features taken into consideration (Bonoli 2003; Esping-Andersen 1999; Hinrichs 2000). Beyond the particularities of different pension regimes, transversal features of national systems can mediate the long-term effects of work interruptions for childbearing and childrearing. One of these is the number of working years required for pension entitlement. If fairly low numbers of insured years are required to access fully covered pensions, the long-lasting effects of work interruptions might be mitigated. Similarly, an availability and generosity of minimum pensions represents a form of income support for women with fragmented working careers, while a substantial level of ordinary pensions can improve economic conditions in later life. Thus, a high retirement age for women with fragmented working careers could affect their pension income in countries with scant minimum income schemes, as could high thresholds of insured years being required for fully covered pensions.

Differences in pension arrangements in the countries analysed are crucial for understanding the long-term effects of job interruptions. In the last three decades, half of the countries analysed have witnessed a slight increase in women's age at retirement, with a reduction of national differences (Scruggs et al. 2014).<sup>iii</sup> However, when focusing on the long-term effects of maternity leave, the evolution of the national pension systems analysed suggests that women's access to pensions varies in the countries considered. Sweden, Denmark and the Netherlands combine a redistribution of public resources that ensure fair economic support even from minimum pensions with mechanisms that foster the permanence of women in the labour market, thus guaranteeing an entitlement to full pension coverage even with a relatively short working career. The female retirement age has been stable at 65 in Sweden and the Netherlands, while Denmark joined these countries in 2004 introducing a reduction of two years. The Dutch pension system does not require a threshold of contribution-years for entitlement to full pension coverage, while in the two Nordic countries this

requirement has gradually increased from a very generous threshold of 15 years in Denmark and 20 years in Sweden in 1980 to 30 and 40 years respectively in 2011. The key feature in these countries is a relatively high level of economic support provided by minimum income pensions compared to the regular one. Indeed, despite a reduction in the Swedish case, the minimum income pension guarantees between 40% and 50% of previous pay, while regular pensions, on average, provide around 50% and 65%.<sup>iv</sup>

Italy, Germany and Spain are characterized by relatively low redistribution toward minimum income schemes with a long earnings history needed to reach the contribution years criterion. Women are entitled to retire after the age of 60 in Italy and 65 in Germany and Spain, with, respectively, 40, 45 and 35 years of work. Additionally, these countries show the largest differential between retirement and minimum pensions in terms of replacement rates. If regular pensions ensure almost the entire fictive reference salary (see note 4), minimum income pensions represent a limited source of economic support for women, with a replacement rate around 18% in Germany and 27% in Italy and Spain. Greece can be included in this group, with the only exception being that women with fragmented working histories are supported with a more generous minimum income pension, with an average replacement rate in the period considered of 45%.

The three remaining countries, France, Belgium and Austria, are characterized by important entry barriers in terms of retirement age and years of contributions, but provide substantial income support in the form of both minimum and retirement pensions. In France and Austria, women are entitled to pension benefits after the age of 60, with 45 and around 40 years of contributions respectively. In this regard, Belgium slightly differs, in that 35 years of working are sufficient to claim retirement pensions. Income support provided by minimum pensions has gradually increased in all three countries, ensuring replacement rates in 2010 of 45% in France and 50% in Belgium, which are just 10-15 percentage points lower than what is ensured by regular pensions. In Austria, instead, retirement pensions ensure around 80% of the reference salary.

As Jefferson (2009) highlights, gender gaps in coverage and contributions often lead to gaps in pension entitlements or benefits, which can be partially compensated by the generosity of non-contributory schemes. Thus, we would expect long-term negative effects of work interruptions to be greater in countries that have stringent age and years of contribution requirements and do not provide generous non-contributory pensions schemes. Hence, the third Hypothesis (H3) is that in countries that have a high contributory year criterion coupled with scant redistribution toward minimum income pensions the long-term effects of work interruption

should be greater, with women more dependent on their partner's income. This should be the case in Italy, Spain, Greece and Germany.

### **Data, Variables and Methods**

The analysis is based on four waves of data from the Survey on Health, Ageing and Retirement in Europe (SHARE),<sup>v</sup> a unique cross-national longitudinal dataset that contains a wealth of information about the present and past lives of adults aged 50 and above in 27 European countries plus Israel. In SHARE, individuals and households were surveyed biannually from 2004-2005 (wave 1) to 2014-2015 (wave 6). Wave 3 is especially important for the scope of this article as it is retrospective and so allows reconstruction of the employment and childbearing histories of the mothers in our sample. Therefore, we select mothers who participated in waves 2, 4 or 5<sup>vi</sup> and for whom there is also retrospective information in wave 3. This rather restrictive selection criterion significantly reduces the size of the sample for each country, and after list-wise deletion of missing cases we were forced to drop from our study many of the initially available countries. Thus, we are left with a total of 7,746, mothers – among which 5,855 are in a partnership – residing in ten countries: Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain and Sweden.

#### *Dependent variables*

We are interested in detecting individual economic consequences of job interruptions for childbearing and childrearing. To this end, we focus on mothers' *absolute earned income* in later life as our first dependent variable. Absolute earned income is a broad measure that includes three main sources of income: income from employment (both as an employee and self-employed); income from pensions (public and private); and income from a lump sum payment. We compute this variable using the imputed net annual incomes provided by the imputation models that each round of SHARE used. We pool together the average values of the multiple imputations of the different income sources, and correct for purchasing power parity.

Our second dependent variable, instead, captures a different aspect of income inequality as it focuses on income differences between women and their partners. The variable – built using the previous income components – represents the mother's share of earned income relative to the sum of her and her partner's earned income. This approach allows for a more inclusive analysis of women's long-term penalties,

highlighting the role of family and pension policies in diminishing between-gender income inequalities in later life.

### *Independent variables*

The main independent variable is derived from the retrospective wave of the survey and taps the length of time that mothers interrupted their careers after the birth of their first child<sup>vii</sup>. Specifically, we use a categorical variable that has five response categories regarding whether and for how long the mother stopped working at the time of the birth of the child: no interruption (reference category); less than a year; over a year but she eventually went back to work; she never returned to work; she was not employed at the time of the birth.

### *Controls*

The multivariate regression models control for a set of potentially confounding variables. These are the mothers' age, level of education (low as reference, medium and high<sup>viii</sup>), employment status (not employed as reference versus employed), the number of children she ever had and the year of birth of the first child. We also include a categorical variable indicating the employment status of the partner (no partner as reference versus retired, employed, other not employed). Finally, we include a variable measuring the mother's pay at the birth of the child. We compute this variable in different stages. We use the first net pay received from work prior to the birth of the first child.<sup>ix</sup> The pay is converted into dollars (Officer 2017), adjusted for inflation to 1999 values (calculation based on the Consumer Price Index), and then converted into euros. When focusing on mothers' relative incomes, we also control for the partner's level of education (low as reference, medium and high). Summary statistics for all the variables included in the models are presented in Table 1.

### *Models*

For both dependent variables, we run models separately by country. Considering that the two outcomes differ in their distribution, we apply two different specifications. For absolute income, it is a common practice to use its natural logarithm rather than the raw version of the variable. However, this strategy has the drawback of eliminating subjects whose income is zero. Considering that we have a considerable number of mothers with zero income, we choose to use an alternative strategy and opt for a generalized linear model (GLM) with a log link (Model 1). This allows us to accommodate the skewed distribution of the variable without losing any observations. For mothers' relative income, since the variable is constrained between 0 and 1 we use a GLM with a logit link and the binomial family with robust standard errors (Model 2).

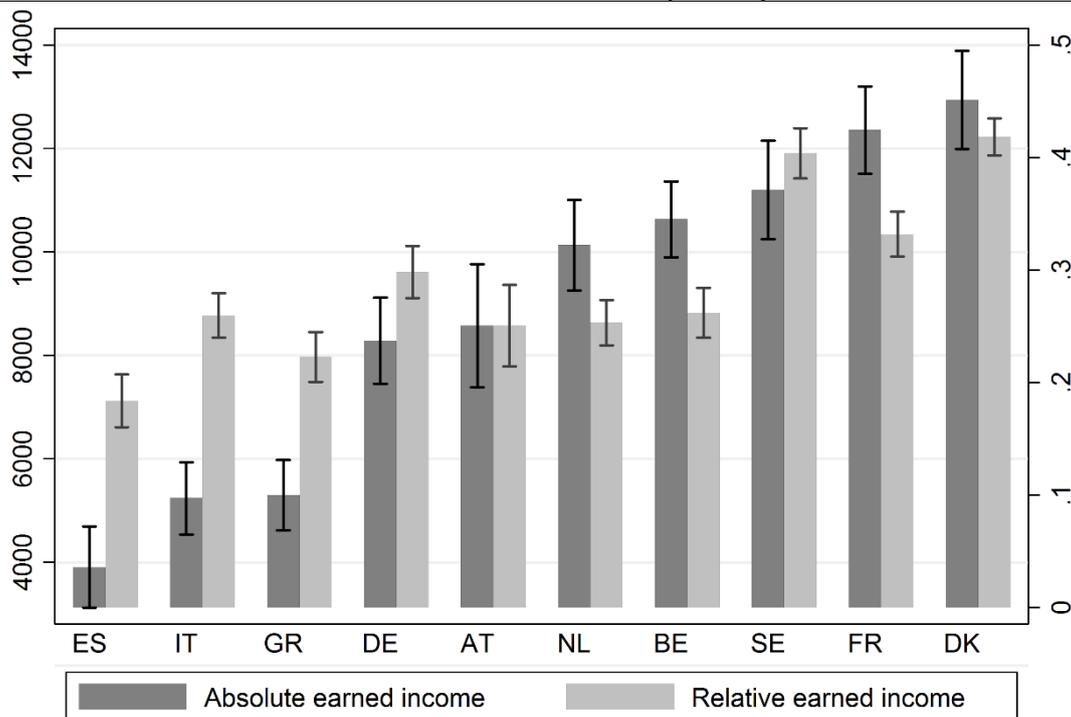
**Table 1** Summary statistics (means and proportions) by country and overall

	Austria	Belgium	Denmark	France	Germany	Greece	Italy	The Netherlands	Spain	Sweden	Total
Absolute income	8573	10631	12941	12356	8282	5300	5235	10127	3906	11201	8362
Work-interruption											
No job interruption	.191	.325	.119	.359	.276	.0649	.176	.101	.0815	.0503	.175
<1 year	.202	.159	.429	.148	.203	.182	.172	.0819	.0908	.385	.192
>1 year	.294	.0665	.107	.102	.255	.0149	.0196	.272	.0244	.302	.119
Never returned	.14	.0829	.0688	.0546	.153	.0263	.0579	.215	.0314	.052	.0806
No job at the time	.173	.366	.277	.336	.114	.712	.575	.33	.772	.211	.433
Age	65.4	64.9	63.9	63.9	63.8	63.5	64.6	64.8	67.5	66.6	64.8
Level of education											
ISCED 0-1	.248	.24	.172	.402	.00531	.585	.589	.132	.698	.286	.371
ISCED 2-3	.569	.501	.437	.404	.731	.299	.348	.673	.246	.348	.437
ISCED 4/6	.183	.26	.391	.194	.264	.116	.0626	.196	.0559	.366	.191
Employment status											
Not employed	.876	.776	.599	.698	.707	.818	.854	.766	.868	.671	.772
Employed	.124	.224	.401	.302	.293	.182	.146	.234	.132	.329	.228
Partner employment status											
No partner	.534	.376	.361	.413	.329	.387	.306	.412	.333	.461	.378
Partner retired	.35	.379	.287	.365	.414	.342	.521	.387	.467	.343	.395
Partner employed	.102	.194	.306	.186	.196	.242	.141	.167	.137	.182	.188
Partner not employed	.0135	.0512	.0448	.0369	.061	.0289	.0317	.0336	.0629	.0139	.0395
N° children	2.35	2.42	2.34	2.41	2.19	2.1	2.33	2.5	2.69	2.26	2.35
Child year birth	1965	1965	1964	1965	1967	1963	1966	1965	1952	1958	1963
N	371	977	581	732	754	1140	1071	684	859	577	7746

## Results

Figure 1 reports the predicted values of absolute and relative earned income in the ten countries. The predictions and confidence intervals are obtained with two models that only include country fixed effects. The figures reflect well-known cross-national differences in maternal earnings: mothers in southern Europe are the ones who have the lowest levels of earned income (Greece, Spain and Italy), followed by mothers in the continental group (Germany and Austria, followed at a distance by the Netherlands and Belgium). Older mothers do considerably better in Sweden, France and Denmark. The results for relative income also mirror previous findings: mothers' share of earned income is below the ideal line of 0.50 in all the countries, but it is closest to equality in the two northern European countries (Sweden and Denmark). It is particularly low in Greece (0.18) and Spain (0.22).

**Figure 1** Predicted values of absolute and relative earned income by country with 95% confidence intervals



Moving to the results from the multivariate models, Table 2 reports the results for absolute income (Model 1). Starting from the upper part of the table, the coefficients for short work interruptions after the birth of the first child are mostly non-significant, indicating that short interruptions have little if any effect on mothers' long-term absolute income. An interesting exception is Belgium, where short interruptions have a positive and significant effect. Work interruptions that lasted over a year are negatively associated with long-term income in Austria, Belgium, France and Germany, but the coefficients are rather small and, at best, significant at 90%.

**Table 2.** GLM results for mothers' absolute income (Model 1). Standard errors in parentheses

	Austria	Belgium	Germany	France	Netherlands
Job interruption after 1st child (r.c. no stop)					
<1	-0.078 (0.102)	0.393* (0.163)	0.141 (0.091)	0.007 (0.070)	-0.289+ (0.168)
>1 year	-0.195+ (0.101)	-0.469 (0.410)	-0.072 (0.092)	-0.172+ (0.104)	-0.413** (0.149)
Never returned to work	-0.543** (0.169)	-0.238 (0.252)	-0.259+ (0.144)	-0.517* (0.213)	-0.807*** (0.224)
No job at the time	-0.256+ (0.132)	-0.294* (0.146)	-0.054 (0.140)	-0.178* (0.079)	-0.323* (0.145)
Constant	14.554 (17.947)	7.637** (2.646)	7.898 (13.770)	6.272 (3.818)	6.162*** (1.637)
N	371	977	754	732	684
BIC	7644.634	22323.223	15870.353	15606.667	15065.093
Log-lik	-3777.945	-11109.978	-7888.799	-7753.865	-7483.587
Sig.	0.000	0.000	0.000	0.000	0.000
	Italy	Spain	Greece	Sweden	Denmark
Job interruption after 1st child (r.c. no stop)					
<1	-0.145 (0.101)	-0.060 (0.118)	-0.419*** (0.116)	0.163 (0.140)	0.070 (0.067)
>1 year	-0.750+ (0.398)	-0.329 (0.244)	-0.032 (0.181)	0.211 (0.141)	0.103 (0.092)
Never returned to work	-0.668** (0.256)	-0.288 (0.363)	-0.520+ (0.305)	-0.029 (0.213)	-0.140 (0.144)
No job at the time	-0.389*** (0.091)	-0.316** (0.122)	-0.483*** (0.115)	0.126 (0.148)	0.136+ (0.077)
Constant	7.081*** (0.982)	5.632*** (0.702)	7.799*** (0.867)	7.746*** (0.650)	7.912*** (1.570)
N	1071	859	1140	577	581
BIC	22038.658	17310.509	23724.489	11974.972	11979.375
Log-lik	-10967.006	-8604.586	-11809.454	-5939.802	-5941.952
Sig.	0.000	0.000	0.000	0.000	0.000

Note: r.c. = reference category. + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

In contrast, never returning to work appears to be negatively associated with long-term income in Austria (-0.543,  $p < 0.01$ ), France (-0.517,  $p < 0.05$ ), Germany (-0.259,  $p < 0.10$ ) and the Netherlands (-0.807,  $p < 0.001$ ), whereas the effect is negative but non-significant in Belgium.

Moving to the lower part of the table, a failure to return to work and not being employed prior to the birth of the first child are negatively associated with long-term income in Greece and Italy. In Greece, short work interruptions are detrimental for mothers' future economic revenue, and in Italy the negative effect is also visible for work interruptions longer than one year. In Spain, only the coefficient for not being employed at the time is negative and significant (-0.316,  $p < 0.001$ ), and work interruptions have no effect whatsoever in Sweden and Denmark. In Denmark, we observe a small but positive and significant ( $p < 0.10$ ) association between long-term income and not working before giving birth to the first child.

The results for relative income (Table 3) once again show that short work interruptions are not associated in a statistically significant manner with mothers' income relative to their partners. However, mothers who stayed at home more than a year experience a significant penalty in Austria (-0.519,  $p < 0.05$ ) and France (-0.356,  $p < 0.01$ ), while the reduction in relative earned income for German and Dutch mothers is negative but non-significant. Never returning to work is the situation that entails the strongest penalty in Austria (-1.487,  $p < 0.001$ ), Belgium (-0.731,  $p < 0.05$ ), France (-1.222,  $p < 0.001$ ), Germany (-1.087,  $p < 0.001$ ) and the Netherlands (-0.379,  $p < 0.05$ ). Finally, not being employed at the time is a significant predictor of lower relative earned income in Belgium (-0.841  $p < 0.001$ ), France (-0.601,  $p < 0.001$ ) and Germany (-0.887,  $p < 0.001$ ). The coefficient is large in Austria as well, although non-significant (-0.609,  $p > 0.10$ ), whereas it is small and non-significant in the Netherlands.

Short work interruptions do not appear to affect long-term relative earned income in the countries displayed in the lower part of Table 3, despite the coefficients being rather large in southern Europe. An interruption longer than one year negatively affects long-term relative income in Italy (-0.630,  $p < 0.05$ ), and a failure to return to work entails a large penalty in both Greece (-0.739,  $p < 0.10$ ) and Italy (-0.933,  $p < 0.001$ ). The coefficients for Spain are also negative but not statistically significant. Finally, not being employed at the time is strongly and negatively associated with the outcome in Greece (-1.034  $p < 0.001$ ), Italy (-0.739  $p < 0.001$ ) and Spain (-0.514,  $p < 0.10$ ). In contrast, Danish and Swedish mothers do not experience significant long-term penalties for work interruptions or for not returning to work after the birth of their first child.

**Table 3.** GLM results for mothers' relative income (Model 2). Standard errors in parentheses.

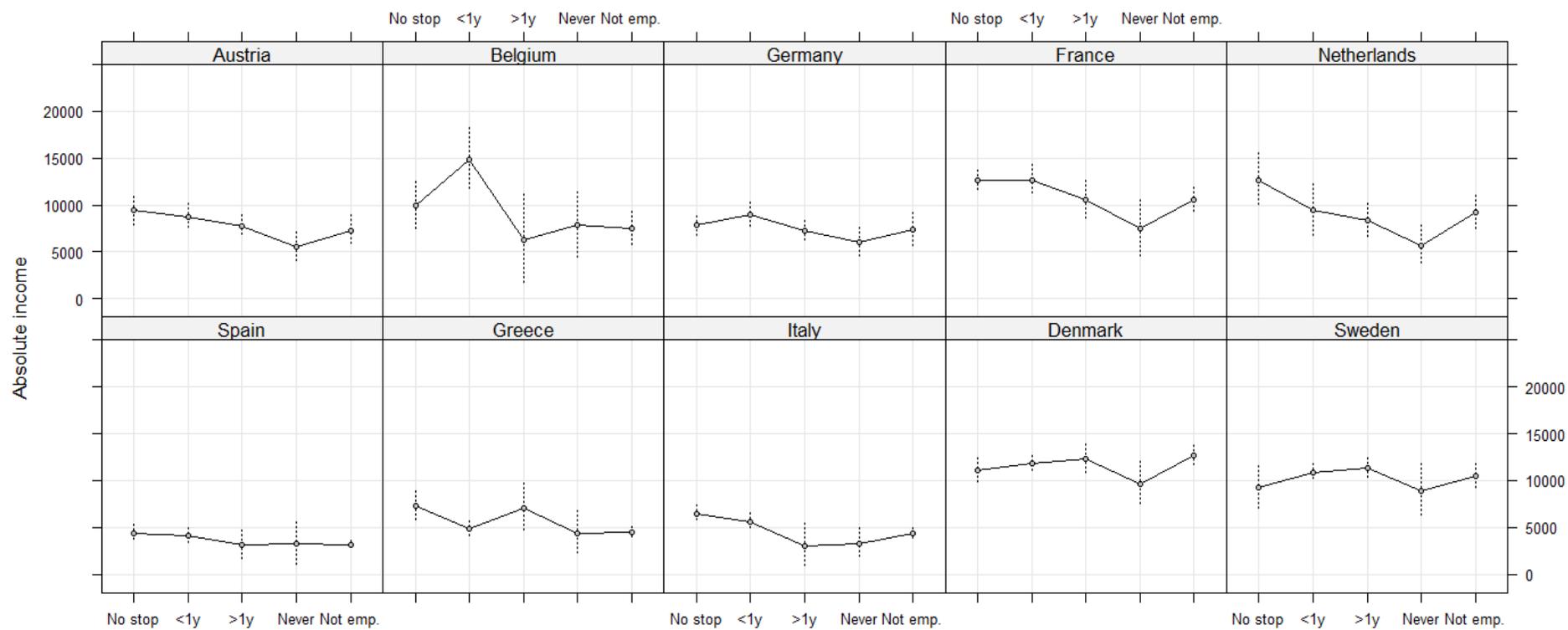
	Austria	Belgium	Germany	France	Netherlands
Job interruption after 1st child (r.c. no stop)					
<1	-0.460 (0.290)	0.036 (0.166)	0.033 (0.161)	-0.121 (0.113)	-0.152 (0.217)
>1 year	-0.519* (0.257)	0.219 (0.200)	-0.279 (0.151)	-0.356** (0.122)	-0.063 (0.150)
Never returned to work	-1.487*** (0.437)	-0.731* (0.286)	-1.088*** (0.175)	-1.222*** (0.244)	-0.379* (0.165)
No job at the time	-0.609 (0.392)	-0.841*** (0.159)	-0.876*** (0.194)	-0.601*** (0.124)	-0.157 (0.155)
Constant	18.518 (39.326)	-2.239** (0.800)	11.963 (27.406)	-24.816 (18.566)	-5.493*** (0.682)
N	200	704	551.000	649	551
BIC	243.421	693.117	564.759	665.318	518.177
Log-lik	-81.973	-297.383	-238.197	-284.093	-211.751
Sig.	0.000	0.000	0.000	0.000	0.000
	Italy	Spain	Greece	Sweden	Denmark
Job interruption after 1st child (r.c. no stop)					
<1	0.074 (0.142)	0.388 (0.339)	-0.320 (0.249)	-0.177 (0.341)	-0.088 (0.088)
>1 year	-0.630* (0.284)	0.320 (0.491)	-0.387 (0.410)	-0.279 (0.341)	-0.045 (0.112)
Never returned to work	-0.933*** (0.251)	-0.387 (0.515)	-0.759+ (0.440)	-0.499 (0.426)	-0.101 (0.148)
No job at the time	-0.739*** (0.121)	-0.514+ (0.273)	-1.034*** (0.247)	-0.075 (0.348)	-0.023 (0.102)
Constant	14.917 (24.755)	-15.270 (37.471)	-5.995 (37.197)	-19.163 (22.116)	2.462 (15.467)
N	742	601	686	481	619
BIC	718.458	522.196	638.613	569.187	671.471
Log-lik	-309.659	-213.108	-270.325	-238.274	-287.525
Sig.	0.000	0.000	0.000	0.000	0.000

Note: r.c. = reference category. + p&lt;0.10, \* p&lt;0.05, \*\* p&lt;0.01, \*\*\* p&lt;0.001

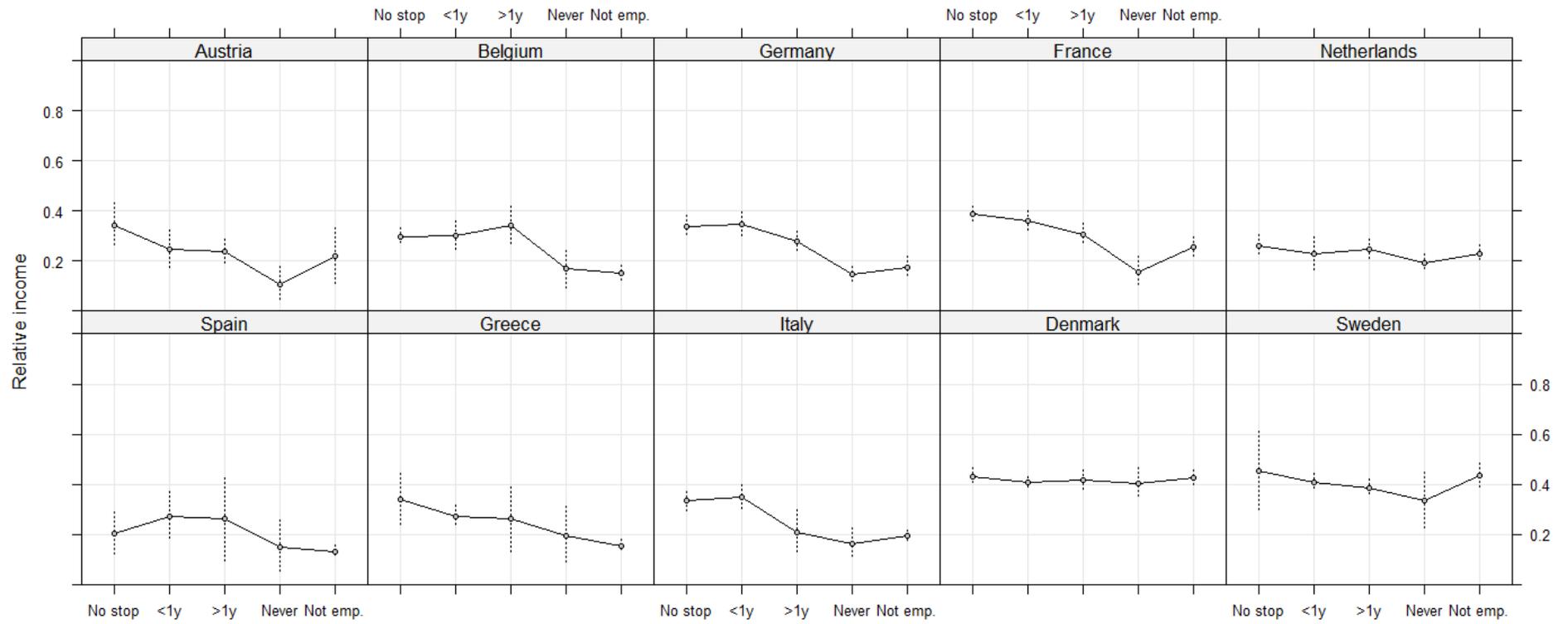
The raw coefficients for the GLMs are not immediately interpretable. Therefore, to clarify the results we report the predicted values with 95% confidence intervals for absolute income (Figure 2) and relative income (Figure 3). A first consideration regards the widths of the confidence intervals. Indeed, probably as a result of the small sample sizes, the estimates produce predicted values that are highly uncertain. Therefore, we are cautious in drawing conclusions from the analysis. However, some considerations can be made. Figure 2 shows that regardless of the length of work interruptions mothers' income is lower in the southern countries than elsewhere. Second, the longer the work interruption, the lower the predicted income in the long run. However, the decline in income appears more abrupt in continental and southern countries than in northern ones. Third, mothers in continental and northern countries who took short breaks seem to have somewhat higher earnings compared to those who did not interrupt at all. While this result could very well be a casualty of the data, it might also reflect some type of selection that was not captured by our measure of earned income at the time of the birth, as mothers with lower incomes might have been less likely to interrupt their jobs and to have high incomes in the future. Fourth, mothers in southern Europe who never returned to work or were not employed at the time have roughly the same predicted income. In contrast, those who were not working at the time fare somewhat better in continental and northern European countries. This might be either because they had greater chances of re-entering the labour market at some point after the birth of the child or, especially in the northern cluster, the welfare state might be more effective in protecting long-term incomes even in the case of interrupted labour market careers. This clearly emerges from Figure 3, which shows the results for relative income. As can be seen, relative earned incomes for mothers in the northern group are basically untouched by work interruptions. In contrast, mothers in both southern and continental countries (except for the Netherlands) see their relative earned income plummet as time away from the labour market increases.

How do our findings map against the hypotheses? In general terms, our first hypothesis is confirmed: the longer the work interruption, the lower mothers' long-term absolute and relative incomes are. Moreover, important cross-national differences in the results bring some support to our second and third hypotheses. Indeed, the negative consequences of job interruptions for childbearing and childrearing appear minimal in the two northern European countries – Sweden and Denmark – where maternity and parental leave allowances have historically been more generous (Gauthier 2011) and where the universalistic pension system offers some form of economic compensation even to workers with highly fragmented work trajectories (Esping-Andersen

**Figure 2** Predicted values of absolute earned income by length of work interruptions and country. The predictions are adjusted by mean setting the values of all covariates in Model 1.



**Figure 3.** Predicted values of relative earned income by length of work interruptions and country. The predictions are adjusted by mean setting the values of all covariates in Model 2.



1990). In contrast, job interruptions for childbearing and childrearing have more serious effects in southern European countries (with the exception of Spain) and continental ones. The results for relative income are even more clear-cut, with the northern countries being exempt from the negative long-term consequences of job interruptions.

## **Conclusion**

In this article, we have addressed the long-term effects of job interruptions for childbearing and childrearing on mothers' absolute and relative income in a comparative European perspective. The study makes three contributions to the literature. First, by looking at mothers in later stages of the life course (i.e. aged 45 and above) the article moves beyond previous studies that focused on the short- and medium-term effects of job interruptions on employment and income. Indeed, older women, especially those living on their own, are a social group at high risk of poverty. Therefore, understanding how family and career histories interact in determining mothers' income in old age is crucial to the development of policy tools to prevent poverty among future generations (Peeters and De Tavernier 2015). Second, the article takes a comparative approach and focuses on ten countries belonging to different welfare and gender regimes (Esping-Andersen 1990; Korpi et al. 2013; Leitner 2003), thus offering a more comprehensive picture compared to previous single-country studies. Third, by looking at both absolute and relative earned income, we have explored two different aspects of income inequality: on the one hand, the focus on absolute income has allowed analysis of the risks that older mothers face in terms of deprivation and poverty; on the other hand, by looking at relative income we have shed light on the balance of earnings and therefore on the power dynamics of a subpopulation that is not often the object of studies of gender inequalities.

The analysis has revealed that short work interruptions do not have negative consequences on mothers' absolute or relative earned income in later life. Indeed, in all the countries considered it is longer work interruptions, that is of one year or more, or a failure to return to work completely that have the largest impact on mothers' long-term economic wellbeing. However, there are some important exceptions to this general rule: mothers in Sweden and Denmark, in fact, are largely unaffected by the length of work interruptions, both in absolute and in relative terms. These results support our hypothesis that the negative effect of work interruptions will be more modest in countries where the welfare state effectively decommodifies its citizens.

Indeed, our results suggest that countries with mixed or low support – in terms of pension schemes or maternity leave – partially fail to limit mothers' long-term income penalties.

Three limitations of the study must be acknowledged. First, the retrospective data we use cover a very long period and therefore might not be fully accurate due to recall bias, in particular concerning income. However, ex-post analysis checking for internal consistency of SHARELIFE data, and comparing recall information with external cross-country historical information leads to the conclusion that scepticism about SHARELIFE data quality is not warranted (Havari and Mazzonna 2011). Second, our estimates are fairly uncertain given the relatively small size of our national samples. Third, and related to this last concern, our results are confined to a sub-sample of countries that were chosen on the basis of data availability and are therefore hardly generalizable to a larger or different pool of countries. Thus, overall, the results should be interpreted cautiously. Nevertheless, the findings suggest that institutional characteristics and life course events are intertwined key factors in an analysis of gender inequalities, especially as far as the cumulative temporal dimension is concerned.

To conclude, we argue that the long-term effects of job interruptions on mothers' income should not be considered only as a product of individual historical legacies, but should be included in a broader reasoning about present and future challenges posed to welfare states. In the EU countries, women dominate the oldest age cohort, and are highly exposed to poverty risks (Peeters and De Tavernier 2015). Additionally, population ageing, decreased fertility, shrinking family sizes, increasing retirement ages and decreasing pension incomes are changing demographic structures and are threatening the social sustainability of welfare systems as we know them (Zaidi et al. 2010). Considering that women are both 'passive' beneficiaries of social benefits and 'active' pivotal elements in intergenerational families, ensuring adequate economic support to older mothers in later life through a correct calibration of family and pension policies is a task that welfare states cannot avoid.

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**Appendix A.1.** GLM results for mothers' absolute income (Model 1). Standard errors in parentheses

	Austria	Belgium	Germany	France	Netherlands	Spain	Greece	Italy	Denmark	Sweden
Age	0.01 (0.009)	0.03*** (0.006)	0,03*** (0.007)	0.02*** (0.004)	0.06*** (0.006)	0.03*** (0.004)	0.01* (0.004)	0.03*** (0.004)	0.01* (0.003)	0.01*** (0.003)
Educational level (r.c. ISCED 0-1)*										
ISCED 2-3	0.24* (0.147)	-0,35* (0.100)	- (0.000)	0.31*** (0.112)	0.51** (0.296)	0.23+ (0.155)	0.19+ (0.127)	0.41*** (0.135)	0.16+ (0.109)	0.09 (0.096)
ISCED 4-6	0.38** (0.192)	-0.01 (0.152)	0.20** (0.089)	0.67*** (0.168)	0.67*** (0.386)	1.04*** (0.365)	0.76*** (0.256)	0.41** (0.219)	0.41*** (0.139)	0.44*** (0.122)
Employment status (r.c. Not employe/d/retired)										
Employed	0.29* (0.163)	-0.13 (0.188)	0.84*** (0.224)	0.41*** (0.109)	0.75*** (0.289)	0.85*** (0.309)	0.40*** (0.172)	0.45*** (0.180)	0.76*** (0.154)	0.50*** (0.115)
Partner's employment status (r.c. No partner)										
Partner retired	-0.58** (0.061)	-0.62*** (0.083)	-0.32*** (0.062)	-0.30*** (0.053)	-0.64*** (0.070)	-0.54*** (0.065)	-0.60*** (0.058)	-0.38*** (0.057)	-0.24*** (0.049)	-0.09 (0.057)
Partner employed	-0.51** (0.110)	-0.40+ (0.157)	-0.20* (0.077)	-0.19** (0.059)	-0.15 (0.128)	-0.08 (0.094)	-0.74*** (0.058)	-0.22+ (0.097)	-0.15** (0.044)	-0.07 (0.066)
Partner not employed	-1.85 (0.323)	-1.00 (0.262)	-0.06 (0.151)	-0.02 (0.130)	-0.38 (0.228)	0.05 (0.136)	-0.72* (0.157)	-0.63+ (0.173)	-0.13 (0.091)	-0.07 (0.255)
Number of children	-0.06 (0.041)	0.04 (0.054)	-0.10* (0.038)	-0.05 (0.028)	-0.06 (0.044)	0.10* (0.048)	-0.00 (0.049)	-0.13** (0.038)	-0,03 (0.024)	-0.04 (0.031)
First child's year of birth	-0.00 (0.008)	0.00 (0.001)	-0.00 (0.006)	0.00 (0.001)	0.00 (0.000)	0.00 (0.000)	0.00 (0.000)	-0.00 (0.000)	0.00 (0.000)	0.00 (0.000)
Monthly wage at the first childbirth	0.04* (0.146)	-0.01 (0.017)	0.05** (0.017)	0.03** (0.010)	0.04* (0.019)	0.01 (0.018)	0.04* (0.017)	0.01 (0.015)	-0.01 (0.007)	-0.00 (0.009)
Costant	14.554 (17.947)	7.637** (2.646)	7.898 (13.770)	6.272 (3.818)	6.162*** (1.637)	7.081*** (0.982)	5.632*** (0.702)	7.799*** (0.867)	7.746*** (0.650)	7.912*** (1.570)
N	371	977	754	732	684	859	1140	1071	581	577
BIC	7644.634	22323.223	15870.353	15606.667	15065.093	17310.509	23724.489	22038.658	11979.375	11974.972
Log-lik	-3777.945	-11109.978	-7888.799	-7753.865	-7483.587	-8604.586	-11809.454	-10967.006	-5941.952	-5939.802
Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: r.c. = reference category. + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. Due to limited number of observation, for Germany high education is contrasted against low and medium education as reference.

**Appendix A.2.** GLM results for mothers' relative income (Model 1). Standard errors in parentheses

	Austria	Belgium	Germany	France	Netherlands	Spain	Greece	Italy	Denmark	Sweden
Age	-0.01 (0.022)	0.05*** (0.009)	0.02	0.04*** (0.009)	0.08*** (0.008)	0.05* (0.019)	0.06** (0.172)	0.05*** (0.013)	0.02* (0.009)	0.01 (0.012)
Educational level (r.c. ISCED 0-1)										
ISCED 2-3	0.06 (0.064)	0.33* (0.163)	-	0.12 (0.102)	-0.20 (0.169)	-0.32 (0.265)	0.00 (0.193)	0.14 (0.143)	0.02 (0.109)	0.11 (0.123)
ISCED 4-6	0.07 (0.073)	0.98*** (0.191)	0.20 (0.140)	0.62*** (0.137)	0.23 (0.218)	0.58+ (0.345)	0.84*** (0.251)	0.35 (0.239)	0.14 (0.121)	0.28* (0.130)
Partner's Educational level (r.c. ISCED 0-1)										
ISCED 2-3	-0.70* (0.291)	0.11 (0.168)	12.66*** (0.619)	-0.14 (0.104)	-0.07 (0.190)	0.10 (0.231)	-0.40* (0.189)	-0.30* (0.127)	-0.12 (0.141)	-0.04 (0.122)
ISCED 4-6	-0.44 (0.344)	-0.03 (0.201)	12.72*** (0.617)	-0.50*** (0.135)	-0.31 (0.212)	-0.24 (0.342)	-0.35 (0.232)	-0.39+ (0.237)	-0.18 (0.150)	-0.16 (0.136)
Employment status (r.c. Not employed/retired)										
Employed	1.01** (0.321)	0.81*** (0.192)	1.18*** (0.161)	0.90*** (0.140)	1.53*** (0.178)	1.79*** (0.266)	0.98*** (0.196)	0.76*** (0.189)	1.08*** (0.113)	0.29+ (0.165)
Partner's employment status (r.c. Retired)										
Employed	-0.51 (0.323)	0.56** (0.209)	-0.43* (0.172)	-0.18 (0.133)	-0.16 (0.176)	0.38 (0.293)	0.52* (0.205)	0.58* (0.186)	-0.47*** (0.104)	-0.06 (0.171)
Other	0.88 (0.674)	1.00** (0.338)	1.03** (0.332)	1.48*** (0.265)	1.73*** (0.386)	1.76*** (0.387)	1.01** (0.391)	2.03*** (0.409)	0.62* (0.255)	0.53 (0.368)
Number of children	-0.29** (0.106)	-0.25*** (0.062)	0.01 (0.060)	-0.05 (0.046)	-0.04 (0.056)	-0.03 (0.100)	0.07 (0.092)	-0.12* (0.059)	0.03 (0.042)	-0.07 (0.065)
First child's year of birth	-0.01 (0.019)	-0.00 (0.000)	-0.01 (0.013)	0.01 (0.009)	-0.00** (0.000)	0.01 (0.018)	0.00 (0.018)	-0.01 (0.012)	-0.00 (0.007)	0.01 (0.010)
Constant	18.518 (39.326)	-2.239** (0.800)	11.963 (27.406)	-24.816 (-18.566)	-5.493*** (0.682)	-15.270 (37471)	-5.995 (37197)	14.917 (24755)	2.462 (15467)	-19.163 (22116)
N	200	704	551.000	649	551	742	601	686	481	619
BIC	243.421	693.117	564.759	665.318	518.177	718.458	522.196	638.613	569.187	671.471
Log-lik	-81.973	-297.383	-238.197	-284.093	-211.751	-309.659	-213.108	-270.325	-238.274	-287.525
Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: r.c. = reference category. + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. Due to a limited number of observations, for Germany high education is contrasted against low and medium education as reference.

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- <sup>i</sup> The data in this paragraph are derived from the Comparative Family Policy Database by Anne Gauthier (2011).
- <sup>ii</sup> Childcare represents a key element in reconciliation policies and thus also plays a role in the new mother's decision to return to work. However, the large time span involved and the greater variability of childcare benefits in the countries considered (e.g. public-private mix in financing) (Cochran, 1993) limit the possibility of including this factor in our analysis.
- <sup>iii</sup> The data used in this paragraph derive from The Comparative Welfare Entitlements Dataset (CWED), and refer only to mandatory public programmes (Scruggs et al. 2014).
- <sup>iv</sup> Replacement rates are calculated for a fictive average production worker in manufacturing who is 40 years old, living alone with no children or other dependents, and who has been working for the 20 years preceding the benefit period (Scruggs et al. 2014).
- <sup>v</sup> The analysis is based on the last release of SHARE data available: 5.0.0.
- <sup>vi</sup> For mothers who participated in more than one wave, we retain only the most recent observation to avoid duplicates.
- <sup>vii</sup> We also test the effects of work interruptions for the second child. The results, not shown but available upon request, are consistent with those for the first child.
- <sup>viii</sup> According to the International Standard Classification of Education (ISCED) 1997 version, these correspond respectively to primary education or lower (ISCED 0 and 1), lower and upper secondary education (ISCED 2 and 3), post-secondary education and above (ISCED 4, 5 and 6). Very few women in Germany had a low level of education. Therefore, for the German models we contrast high education against a pooled category of low and medium as the reference.
- <sup>ix</sup> In the sample, the average difference in years between the first birth and the wage reference year is 3.57. We also create a variable related to the second child using the same procedure.